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## Review Article

# Bacterial Vaginosis: Risk of Adverse Pregnancy Outcome

## Abstract

The reproductive health of a woman is vital not only for her general health, but also for that of her partner and child. Bacterial infections can affect pregnant women from implantation of the fertilized ovum through the time of delivery and peripartum period. They may also affect the fetus and newborn. Symptomatic pregnant women with confirmed bacterial vaginosis should be treated. Treatment of pregnant women with asymptomatic bacterial vaginosis is controversial. Guidelines from the Centers for Disease Control and Prevention (CDC) recommend treating asymptomatic high-risk pregnant women with bacterial vaginosis. Antibiotic treatment can eradicate bacterial vaginosis in pregnancy but overall risk of preterm birth (PTB) is not significantly reduced. Present antibiotic therapy (metronidazole and clindamycin), both oral and vaginal, do not reduce the risk of PTB. Probiotics have capability to increase vaginal lactobacilli, restore the vaginal microbiota to normal and hence helps to cure bacterial vaginosis. Therefore, Probiotics should be considered as part of the prevention and as an adjunct to antimicrobial treatment approach for BV.

## Introduction

Bacterial vaginosis (BV) is a complex clinical syndrome characterized by alterations in the normal vaginal flora and a malodorous discharge when symptomatic [1]. Bacterial vaginosis is present in up to 20% of women during pregnancy. The majority of these cases will be asymptomatic. Most women identified as having bacterial vaginosis in early pregnancy are likely to have persistent infection later in pregnancy [2]. In pregnancy, BV has been associated with adverse outcomes such as miscarriage, premature rupture of membranes, preterm birth, and low birth weight [1].

The babies can suffer from problems related to their immaturity both in the weeks following birth such as breathing difficulty, infection and bleeding within the brain as well as problems when growing up such as poor growth, chronic lung disease and delayed development [2].

Perinatal mortality is high in India and a major contributor for this is preterm delivery and associated low birth weight. Ascending uterine infection from the lower genital tract due to bacterial vaginosis (BV) has been implicated as an important causative factor for many pregnancy complications namely preterm labor (PTL), preterm premature rupture of membranes (PPROM) chorioamnionitis and endometritis.

Association of BV with adverse outcomes in pregnancy: Meta-analysis conducted to study about adverse outcomes

associated with bacterial vaginosis including over 30,000 women from 32 studies showed that bacterial vaginosis approximately doubled the risk of preterm delivery in asymptomatic patients as well as significantly increased the risks of late miscarriage and maternal infection [2].

In a study conducted on 200 women in Lok Nayak Hospital (New Delhi), it was found that among the cases of BV, 59.6% had adverse maternal and/or fetal outcome. A 7.5-fold increased risk of late miscarriage and 3.22-fold increased risk of preterm labor and/or delivery was observed [3]. One study examining several pregnancy outcomes related to BV diagnosed during the first trimester of pregnancy reported a 2.6-fold increased risk of preterm labor, a 6.9-fold increased risk of preterm delivery and a 7.3-fold increased risk of preterm, premature rupture of the membranes [4].

Another study found that BV diagnosed in the second trimester was associated with an increased risk of preterm delivery and premature rupture of the membranes and that BV accounted for 83% of the attributable risk for preterm birth [5].

## Discussion

Studies have shown that the risk of an adverse outcome is particularly high in a patient with previous miscarriages have a positive vaginal smear for BV in early pregnancy [6]. Although bacterial vaginosis has been shown to be an independent risk factor for these complications, many health care professionals

still consider bacterial vaginosis more of a nuisance than a genuine fetal-maternal threat.

Variation in the incidence rates of BV during pregnancy: In a cohort study, 1,006 pregnant women between 16–28 weeks' gestation were screened for BV (Nugent's criteria) and for lower genital tract infection. Prevalence of BV was 11.53% and was associated with an increased risk of preterm birth (PTB) and premature rupture of membranes (PROM). BV accounted for 82.53% of the attributable risk for PTB [5].

In a study conducted on 200 pregnant women, 38.5% were found to be have symptomatic BV and it was also noted that incidences of preterm labour was more in untreated cases. Challenges associated with BV based on trimesters: Studies have demonstrated that the more advanced the gestational age at testing, the lower the detection rate of vaginosis and the lower its predictive value for preterm delivery [7–9].

### When should the screening for BV be conducted during pregnancy?

It appears that infection with bacterial vaginosis in early pregnancy (second trimester) conveys a greater risk for complications than infection with bacterial vaginosis in late pregnancy [10]. However, a positive test for bacterial vaginosis in early pregnancy may be a poor predictor for the development of preterm birth, preterm labor and premature rupture of the membranes [4].

Based on increased risk, CDC guidelines recommend screening early in the second trimester [11].

### Limitations of existing therapy

Topical clindamycin vaginal cream is ineffective in reducing the rates of preterm birth [8,12]. In fact, such treatment actually increases the presence of vaginal *Escherichia coli*, an organism known to increase the risk for preterm birth [13,14].

Topical metronidazole gel has not been evaluated in the context of bacterial vaginosis during pregnancy. Topical antibiotics usually eradicate local bacterial vaginosis infection, but do not reduce prematurity sequelae because of the lack of access to the upper genital tract [13,14]. Oral metronidazole and metronidazole combined with erythromycin have been shown to reduce pregnancy complications associated with bacterial vaginosis [13,14]. But because metronidazole use is contraindicated during the first trimester, only women in mid to late pregnancy can be treated with the drug.

Although pregnant women with bacterial vaginosis obviously have an increased risk for pregnancy-related complications, it is unknown whether therapeutic intervention decreases the rate of specific fetal-maternal problems for all pregnant women. In a study conducted in 200 women of late first trimester of pregnancy, most frequently occurring species were found to be *Lactobacillus crispatus* and *Lactobacillus gasseri*, followed by *Lactobacillus jensenii* and *Lactobacillus rhamnosus* [15]. Recent reports indicate that exogenous strains

of probiotics are useful in reestablishing a normal healthy vaginal flora and through judicious selection and delivery of probiotic strains to mitigate and eliminate the vaginosis [16].

Are probiotics safe during pregnancy? Probiotics do not appear to pose any safety concerns for pregnant and lactating women [17]. In-vitro studies have suggested that certain specific strains of lactobacilli are able to inhibit the adherence of *Gardnerella vaginalis* to the vaginal epithelium and/or produce  $H_2O_2$  (hydrogen peroxide), lactic acid and/or bacteriocins, which inhibit the growth of bacteria causing BV [18].

A positive smear at mid trimester (score  $\geq 4$ ) in pregnant with previous preterm delivery doubles the risk of recurrence. For women with a history of previous preterm birth there is some suggestion that treatment of bacterial vaginosis may reduce the risk of preterm pre labour rupture of membranes and low birth weight [19].

### Conclusion

In women at risk for preterm delivery an adverse outcome is more likely if bacterial vaginosis is detected in the first trimester. Treatment of bacterial vaginosis in pregnant women reduces the rate of preterm birth. Probiotics should be considered as part of the prevention and as an adjunct to antimicrobial treatment approach for BV.

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